# Behaviours and validation

## Acceptance Criteria

**1.1 (**as given in loan-amortiser.feature) :

**When** the user accesses the Loan Amortiser (wait for the Calculate button to be visible)

**Then** the user has the ability to capture details about the loan with the following default values (i.e. check that what’s displayed as default matches those in loan.amortiser.feature) :

* Loan Amount
* Loan Term
* Interest Rate

**2.1** Loan Calculator form :

**When** the user clicks Calculate

**And** (

Loan Amount is not entered

**Then** error message ‘The amount of the loan must be provided’ must be displayed

**Or** Loan Amount <= 0

**Then** error message ‘The amount of the loan must be greater than 0’ must be displayed

**Or** Loan Term is not entered

**Then** error message ‘The term of the loan must be provided’ must be displayed

**Or** Loan Term <= 0

**Then** error message ‘The interest rate of the loan must be greater than 0’ must be displayed

**Or** Interest Rate is not entered

**Then** error message ‘The interest rate of the loan must be provided’ must be displayed

)

**2.2**

**When** the user clicks Calculate

**And** there are no field validation errors

**Then** Loan Repayment Details panel and Loan Schedule panel must be displayed

**2.3** **When** the user clicks Reset

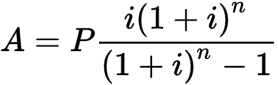
**Then** default input values to be set (as specified in loanCalculatorForm.tsx)

**And** panels LoanRepaymentDetails and LoandSchedule to disappear

**Loan calculations and display of values**

3.1 **When** Loan Repayment Details panel displayed as per 2.2

**Then** the following values must be calculated as per the following formula :



Where

* **A** is the monthly repayment amount
* **P** is the loan amount
* **i** is the periodic interest rate and is taken as the Interest Rate as entered by the user converted to % then divided by **12** the number of periods (months) in a year i.e. = Interest rate / 100 / 12  
  **Note** : there appears to be an error in useAmortisation.ts where instead of 12 the loan term (i.e. number of payments in total) is being used in this calculation.
* **n** total number of payments

**And** the following values must be displayed in a panel as per screen designs (assumed supplied) :

* MONTHLY REPAYMENT AMOUNT. Value is **A** as calculated above
* TOTAL INTEREST PAYABLE. Value is TOTAL AMOUNT REPAYABLE below – **P** the loan amount.
* TOTAL AMOUNT REPAYABLE. Value = **A** \* **n**

3.2 **When** Loan Schedule panel displayed as per 2.2

**Then** using the values as calculated in 3.1 the following table of values must be displayed in a panel as per screen designs (assumed supplied), where each row consists of :

* INSTALMENT : payment number 1, 2, 3 etc to n the number of payments
* PAYMENT : value is **A** as calculated above and is the same for each row
* PRINCIPAL : value is **P** (the loan amount) for row 1 then (**B** \* (**1** + **i**)) – **A** for all subsequent rows, where B is the Balance from the previous row
* INTEREST : value is **B** \* **i** where B is the balance from the previous row
* BALANCE : value is **B** from the previous row – **A** the payment.

**3.3** All monetary values to be displayed as GBP currency e.g. £25,000.00

# Potential issues

* Rounding errors : may not always end with £0.00 as final balance outstanding
* Negative values : due to rounding may end up with -£0.00 as final balance outstanding
* Periodic interest rate appears to be calculated incorrectly, being divided by n the number of payments and not 12 as per the readme file :   
  *Our calculator assumes 12 periods per year (i.e. monthly) for the purpose of deriving the periodic interest rate, and payments being made monthly for the purpose of deriving the total number of payments (i.e. a term of 12 is 12 payments).*